

UNIT  
9ONLINE  
LAB*Amoeba Observation Lab*

Note: this lab is completed online. Visit the following address and click on "Lab 1"

<http://labs.7bscience.com/protist-labs.html>

**Purpose:**

- To observe amoeba and how they move
- To identify the parts of an amoeba

**Part One - Background**

Today we will be observing an organism classified as a protist. A protist is any \_\_\_\_\_ that cannot be classified as a plant, animal, or fungus. There are several types of protists. We will be learning about three types of protists: \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_. In this lab you will be observing a type of protist called a protozoan. A protozoan is a protist that is similar to an \_\_\_\_\_. All protozoans are \_\_\_\_\_ and hunt or search for their food.

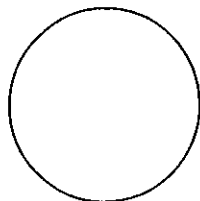
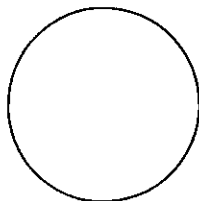
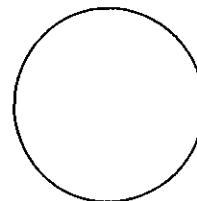
One way protozoans are classified into groups is by how they \_\_\_\_\_. In general, there are three ways protozoans move: by \_\_\_\_\_, by \_\_\_\_\_, or by \_\_\_\_\_.

The protozoa you will observe today is called the amoeba. An amoeba is unicellular and moves by using \_\_\_\_\_. A pseudopod is a temporary \_\_\_\_\_ that forms in the \_\_\_\_\_ as a result of the movement of the cytoplasm. The word pseudopod means "false foot." The pseudopod has two functions, or uses: 1. \_\_\_\_\_, 2. \_\_\_\_\_. The picture on the web site shows an example of a pseudopod in an amoeba. (Note: in the picture the cytoplasm is called the "plasmal" and the cell membrane is called the "plasma membrane.")

**Part Two - Observing Movement**

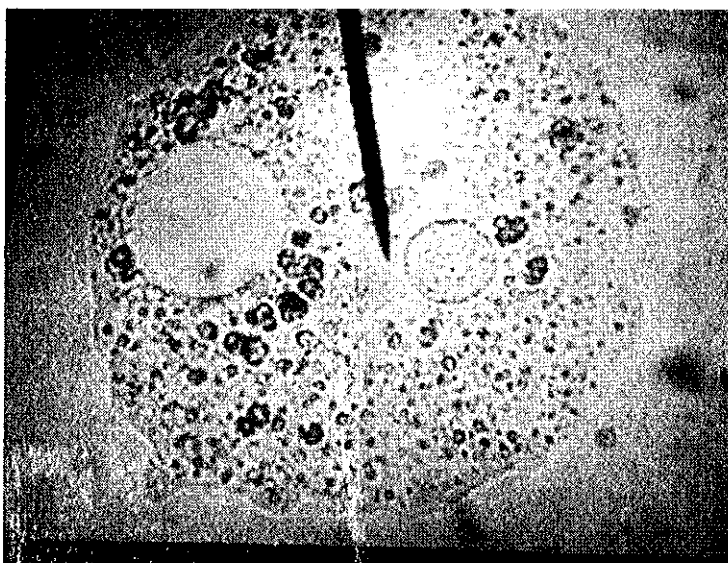
The video on the web site shows how the amoeba moves. When the amoeba moves by pushing cytoplasm in one direction, it forces the cell to move into that direction.

Observe the movement of the amoeba in the video. Draw what it looks like at 0 seconds, 15 seconds, and 30 seconds. Draw an arrow on each of your pictures indicating where the cytoplasm is moving. (Draw your pictures on the next page.)

*Amoeba at 0 sec**Amoeba at 15 sec**Amoeba at 30 sec*

### Part Three - Cell Structures

The amoeba has many easily identified parts. First, locate the nucleus. It is circular in shape, darker in color, and appears to have a rough surface. Just as in other cells we have studied, the nucleus is the control center of the cell; it contains the genetic information (DNA). You should also be able to see another large, clear circle (on the left). This is the contractile vacuole.

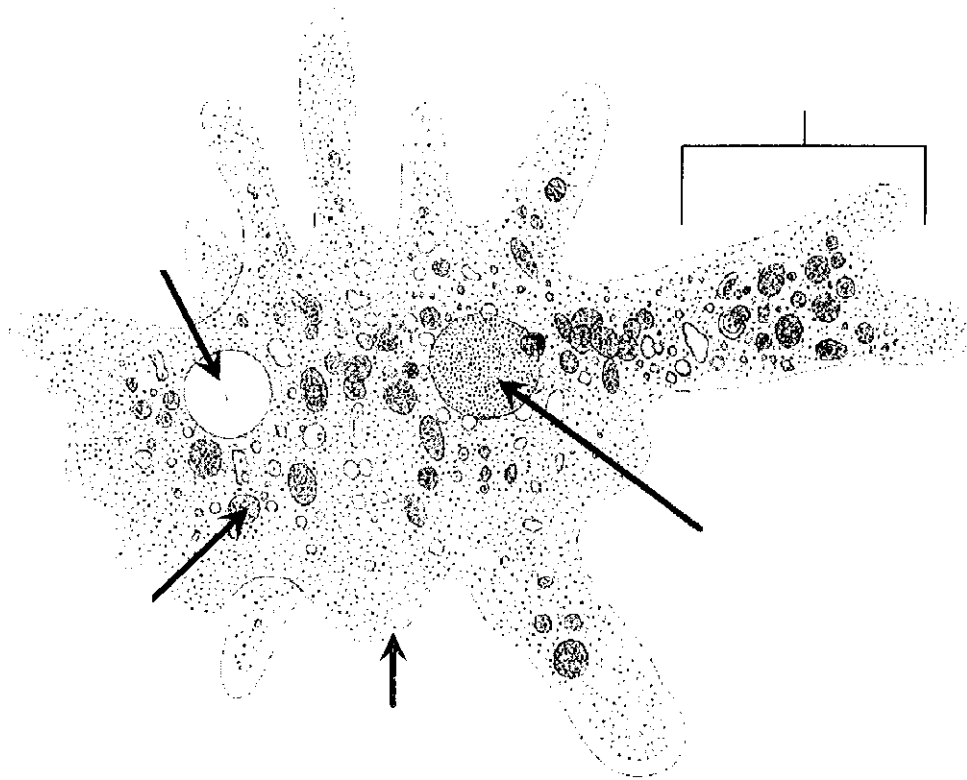


The contractile vacuole collects water that enters the cell from osmosis. It temporarily stores water before removing it from the cell. Observing a live specimen, you can see the contractile vacuole expand and contract as it fills with and removes water!

You'll also be able to observe food vacuoles. The food vacuoles store food particles for the amoeba. In the picture below, they appear in a greenish color. The green organisms that the amoeba fed on are called *chlorella*. The outer part of the amoeba is the cell membrane.

**Part Four - Labeling the Diagram**

Label the diagram below with the following parts: cell membrane, contractile vacuole, food vacuole, nucleus, and pseudopod.



UNIT  
9ONLINE  
LAB*Paramecium Observation Lab*

Note: this lab is completed online. Visit the following address and click on "Lab 2"

<http://labs.7bscience.com/protist-labs.html>

**Purpose:**

- To observe paramecium and how they move
- To identify the parts of an paramecium

**Part One - Background**

Today you will observe another protist. In the previous lab (online or in class) you observed a type of protist called a protozoan. Recall that protozoans are animal-like protists. That is, they have similar characteristics to animals. Mainly, they are heterotrophs and they must hunt for their food.

Recall that protozoans can be classified by how they move. In the last lab you observed a type of sarcodine called an amoeba. All sarcodines move by using pseudopods, or temporary bulges in the cell membrane.

The protozoa you will observe today is called the paramecium. A paramecium is unicellular and moves by using \_\_\_\_\_. Cilia are \_\_\_\_\_ structures that are found on the surface of the organism. Cilia have three uses: 1. \_\_\_\_\_, 2. \_\_\_\_\_, 3. \_\_\_\_\_. Observe the video on the web site to see the cilia move on the paramecium.

**Part Two - Cell Structures**

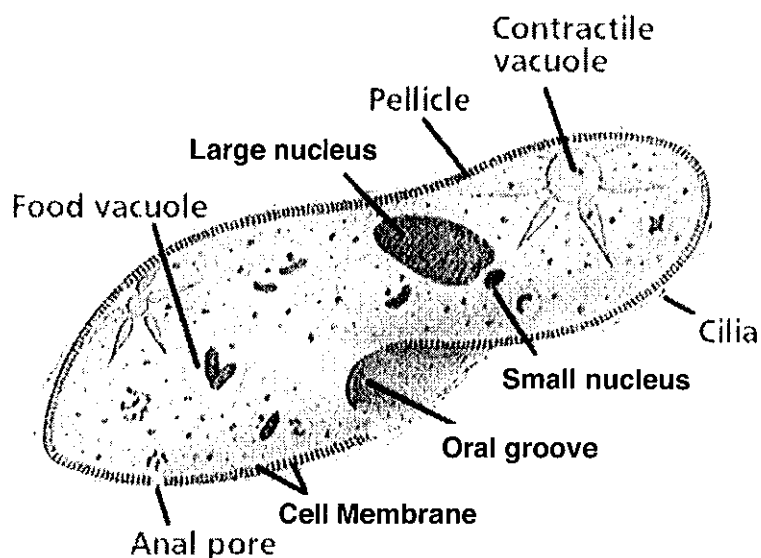
Identifying structures in the paramecium is rather simple! As you read the information, fill in the blanks on your worksheet and identify the structures on your diagram.

First, observe the outside of the organism. What appears to be the cell membrane is actually a part called the \_\_\_\_\_. The pellicle is a \_\_\_\_\_, outer \_\_\_\_\_ that helps give the paramecium its \_\_\_\_\_. Unlike the amoeba, the paramecium is not able to change shapes (although it can bend and twist). Just below the pellicle you will find the \_\_\_\_\_.

On the surface of the organism are short hair-like structures are the \_\_\_\_\_. As you already learned, the cilia have three functions: to help the paramecium move, to help

it capture food, and to help it sense the environment. Also on the surface you will find an indentation called the \_\_\_\_\_. The oral groove is lined with \_\_\_\_\_ to help the organism capture \_\_\_\_\_. At the end of the oral groove is where the paramecium takes in its food through \_\_\_\_\_. The food enters the organism and becomes trapped in a \_\_\_\_\_. The vacuole stores the food and is broken down when it combines with a \_\_\_\_\_. You may also be able to observe a part on the surface called the \_\_\_\_\_. The anal pore is where the \_\_\_\_\_ leaves the organism.

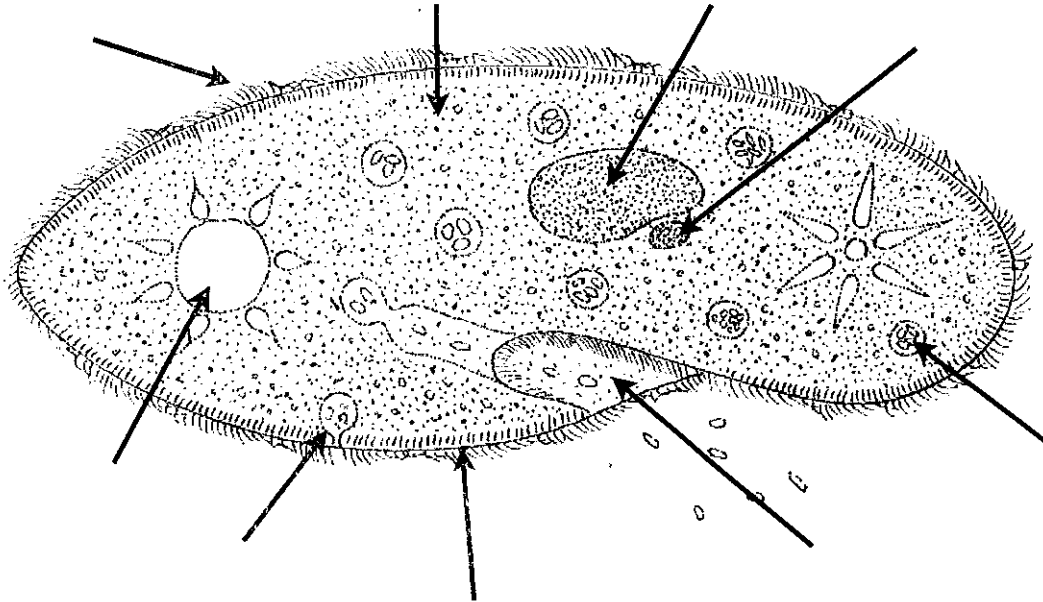
Inside the organism you will also note a star-shaped organelle. This is the \_\_\_\_\_. As with the amoeba, the contractile vacuole collects and removes excess \_\_\_\_\_. You can observe the contractile vacuole work in the video. Also inside you will find not one but TWO \_\_\_\_\_. The large nucleus controls the \_\_\_\_\_ of the cell. The large nucleus is visible and is a slightly different color from the rest of the organelles. The small nucleus only controls \_\_\_\_\_.



Paramecium can reproduce in two ways: asexually through \_\_\_\_\_ and sexually through \_\_\_\_\_. In our bacteria unit we learned what binary fission and conjugation are. The same processes are true for paramecium. In binary fission, the cell splits in two and each cell receives the same copy of DNA from the parent cell. In conjugation, the paramecium shares genetic material with another paramecium before splitting. After splitting, each paramecia now has different DNA than the parent originally had.

**Part Four - Labeling the Diagram**

Label the diagram below with the following parts: anal pore, contractile vacuole, cytoplasm, cilia, food vacuole, oral groove, pellicle, large nucleus, small nucleus



UNIT  
9ONLINE  
LAB*Euglena Observations Lab*

Note: this lab is completed online. Visit the following address and click on "Lab 3"

<http://labs.7bscience.com/protist-labs.html>

**Purpose:**

- To observe euglena and how they move
- To identify the parts of an euglena

**Part One - Background**

Today you will observe another protist. In the previous labs (online or in class) you observed a type of protist called a protozoan. Now you will observe a type of protist called an algae. All algae are \_\_\_\_\_ protists. This is because they are autotrophs--- they use \_\_\_\_\_ to make their own food.

The algae you will observe today is called a euglena. It is a type of \_\_\_\_\_. Euglena are examples of algae because its cell contains \_\_\_\_\_ which allow it to carry out \_\_\_\_\_. However, scientists have observed that euglena can also be \_\_\_\_\_; they can also eat to obtain energy!

Euglena also have \_\_\_\_\_ that help them survive. For example, they have flagella that allow them to \_\_\_\_\_, a pellicle which gives them their \_\_\_\_\_, and an eye spot which is used to help detect the location of \_\_\_\_\_. In fact, if you place euglena in a container, place it by a sunny window, and cover half the container, the euglena will move to the sunny side!

**Part Two - Cell Structures**

The structure of the euglena is similar to the other protists we have studied. On the outside of the euglena is the \_\_\_\_\_. Recall that the pellicle is a \_\_\_\_\_ but \_\_\_\_\_ covering that gives the organism its shape. Underneath the pellicle you will find the \_\_\_\_\_. You will also find the \_\_\_\_\_, the long whip-like structure used for \_\_\_\_\_.

Inside the euglena we will find several familiar organelles. First, you should be able to observe the \_\_\_\_\_. Unlike the paramecium, the euglena only has one nucleus. It controls the \_\_\_\_\_. In addition you should be able to observe contractile vacuoles. Recall that the contractile vacuole collects and expels excess water

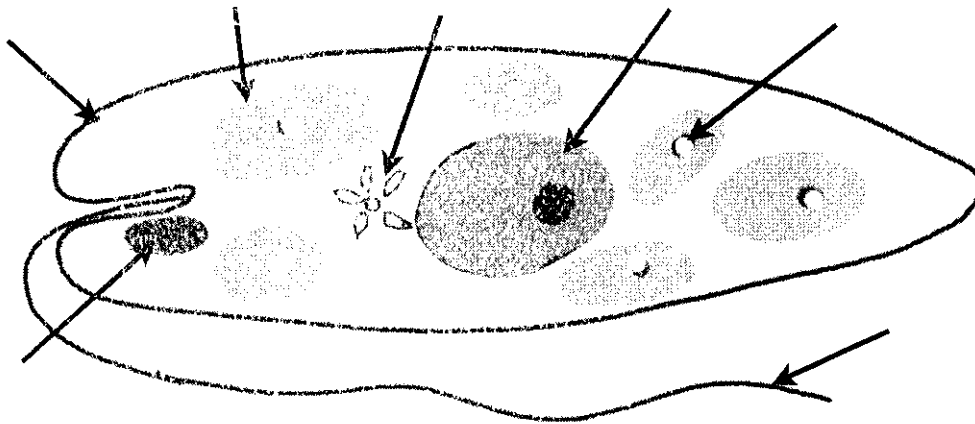
from the cell. Another common organelle is the \_\_\_\_\_. These green structures allow the euglena to carry out \_\_\_\_\_.

Now let's learn about some new organelles. First, you should be able to observe a red spot. This is called the \_\_\_\_\_ (also known as the \_\_\_\_\_). It helps the euglena detect sources of \_\_\_\_\_. It works by blocking some light sources so the euglena can tell which direction the brightest source is coming from. Second, you will notice long, rod-shaped parts. These are called the \_\_\_\_\_. They are similar to \_\_\_\_\_. They store \_\_\_\_\_ created during photosynthesis. Sometimes these appear as spots on or near the chloroplasts.

Before moving on, watch the videos to see how many parts you can identify.

### Part Three - Labeling the Diagram

Label the diagram below with the following parts: chloroplast, contractile vacuole, flagellum, nucleus, paramylon granule, pellicle, and eye spot (stigma)



*Part four is found on the next page.*



**Part Four - Reflecting**

Answer the following questions.

1. Which group of protists do euglena belong to? \_\_\_\_\_
2. Euglena contain chloroplasts. When light is limited, they can eat particles to obtain energy. Are these organisms classified as heterotrophs or autotrophs? \_\_\_\_\_
3. Euglena are not the only organisms that have flagellum. Zooflagellates are protozoa that also have flagella. Although euglena and zooflagellates move by flagella, why are these organisms classified differently? \_\_\_\_\_
4. Name two organelles you could find in a euglena that you couldn't find in a zooflagellate.  
\_\_\_\_\_  
\_\_\_\_\_
5. You place millions of euglena into a container and place it by the window. The entire container is a bright green color as the euglena swim freely. You cover half the container, block out the sunlight. At the end of the day, you return to the container and find that all the euglena are now on the uncovered side. Explain why this happened. Your answer must include the words: eye spot (stigma), sunlight, and photosynthesis.  
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